MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 3 2022/2023

BFN2254 – FINANCIAL STATISTICAL ANALYSIS

(All sections / Groups)

05 OCTOBER 2023
9.00 a.m. - 11.00 a.m.
(2 hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of **6 pages** with **4 questions** only excluding the cover page.
2. Attempt **ALL** questions and write your answers in the Answer Booklet provided.
3. Students are allowed to use non-programmable scientific calculators that are permitted to be used in the examination.

Question 1 [20 Marks]

a) The "expense ratio" is a measure of the cost of managing the portfolio. This value is very important to investors because fund operating and management fees can have a large impact on net profitability of the investment. Generally, investors prefer a low expense ratio. Below are the SPSS outputs generated from expense ratios (in percentages) for 23 randomly chosen stock funds and 21 randomly chosen bond funds.

Statistics

		Stock	Bond
N	Valid	23	21
	Missing	0	2
Mean		1.4591	.7986
Median		1.2700	.8500
Std. Deviation		.84153	.34925
Skewness		1.863	.691
Std. Error of Skewness		.481	.501
Kurtosis		4.814	1.006
Std. Error of Kurtosis		.935	.972

i. Compare the average value of the expense ratios for both funds. Which one is generally preferred by the investors? [3 marks]

ii. Based on the standard deviation values, which type of fund has expense ratio with more variability? Explain. [3 marks]

iii. Interpret the values of skewness and kurtosis coefficients of expense ratios for both funds. Which fund is riskier? Explain. [8 marks]

b) A life insurance company is interested in investigating the correlation between the age at death of male customers with their mothers' and fathers' age at deaths. From the data of 100 recently deceased male customers, the correlation analysis result is as shown:

Correlations

		AgeatDeath	Mother	Father
AgeatDeath	Pearson Correlation	1	.706	.664
	Sig. (2-tailed)		<.001	<.001
	N	100	100	100

At α=5%, is there any significant correlation between age at death of its male customers with their mothers' and fathers' age at deaths? Discuss the degree and direction of the correlation (if any). [6 marks]

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Question 2 (25 Marks)

a) Describe one similarity and two differences between Independent T-test and Mann-Whitney test in terms of the underlying assumptions or application conditions. [6 marks]

b) An important component of the living cost is the amount of money spent on housing. An economist undertook a 5-year study to determine how housing costs have changed. He took a random sample of 200 households and recorded the percentage of total income spent on housing five years ago and took another sample of 200 households this year. The data were analyzed, and the results were obtained as below. Assume that,

Group 1 – Five year ago *Group 2 – This year*

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Year	Statistic	df	Sig.	Statistic	df	Sig.
HousingCost	Five years ago	.049	200	.200	.994	200	.588
	This year	.058	200	.200	.992	200	.388

		Levene's Test for Equality of Variances		t-test for Equality of Means			
						Significance	
		F	Sig.	t	df	One-Sided p	Two-Sided p
HousingCost	Equal variances assumed	1.143	.286	-2.025	398	.022	.044
	Equal variances not assumed			-2.025	393.711	.022	.044

i. Does the data analysis involve independent or dependent samples? Justify your answer. [2 marks]

ii. Does the data follow a normal distribution? [4 marks]

iii. Does the data fulfill the assumption of homogeneity of variances? [5 marks]

iv. At 5% level of significance, can we conclude that the housing cost has increased over the last 5 years?
Note: The procedure of checking assumptions is not necessary. [8 marks]

Continued...

Question 3 (25 Marks)

The more costly and time-consuming it is to export and import, the more difficult it is for local companies to be competitive and to reach international markets. As part of an initial investigation exploring foreign market entry, 10 countries were selected from each of four global regions. The cost associated with importing a standardized cargo of goods by sea transport in these countries were recorded and analyzed. The following outputs were generated from the data analysis.

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	GlobalRegion	Statistic	df	Sig.	Statistic	df	Sig.
ImportCost	East Asia & Pacific	.273	10	.133	.833	10	.136
	Eastern Europe	.226	10	.160	.785	10	.110
	Latin American	.173	10	.200	.934	10	.483
	Middle East	.198	10	.200	.928	10	.432

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
ImportCost	Based on Mean	2.427	3	36	.181

ANOVA

ImportCost

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1151016.475	3	383672.158	4.663	.007
Within Groups	2961835.300	36	82273.203		
Total	4112851.775	39			

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Multiple Comparisons

Dependent Variable: ImportCost

LSD

(I) GlobalRegion	(J) GlobalRegion	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
East Asia & Pacific	Eastern Europe	46.500	128.276	.719	-213.66	306.66
	Latin American	-375.100*	128.276	.006	-635.26	-114.94
	Middle East	-214.300	128.276	.103	-474.46	45.86
Eastern Europe	East Asia & Pacific	-46.500	128.276	.719	-306.66	213.66
	Latin American	-421.600*	128.276	.002	-681.76	-161.44
	Middle East	-260.800*	128.276	.049	-520.96	-.64
Latin American	East Asia & Pacific	375.100*	128.276	.006	114.94	635.26
	Eastern Europe	421.600*	128.276	.002	161.44	681.76
	Middle East	160.800	128.276	.218	-99.36	420.96
Middle East	East Asia & Pacific	214.300	128.276	.103	-45.86	474.46
	Eastern Europe	260.800*	128.276	.049	.64	520.96
	Latin American	-160.800	128.276	.218	-420.96	99.36

*. The mean difference is significant at the 0.05 level.

a) At the 1 percent level of significance, is there evidence of a difference in the mean cost of importing across the four global regions? [12 marks]

b) From the LSD post-hoc test, determine which global regions significantly differ in mean cost of importing? Use 5% significance level. [6 marks]

c) Assuming that the data is not normally distributed, and the data has been re-analyzed using a non-parametric test as below:

Independent-Samples Kruskal-Wallis Test Summary	
Total N	40
Test Statistic	13.052
Degree Of Freedom	3
Asymptotic Sig (2-sided test)	.005

At the 5% level of significance, is there a difference in median cost of importing across the four global regions? [7 marks]

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Question 4 (30 Marks)

a) A study was conducted to explore the attitudes and challenges that small businesses face related to sales and marketing. Small businesses owners were categorized by the amount they spend per month on marketing activities as well as the attitudinal segment to which they belong as shown in the following crosstabulation table:

		MarketingExpenses			
		Less than $200	$200 to $1000	More than $1000	Total
Attitudinal	Freedom Seekers	89	64	40	193
	Passionate Creators	64	82	63	209
	Struggling Survivors	87	66	48	201
	Legacy Builders	122	63	49	234
Total		362	275	200	837

The following analysis outputs have been obtained.

Chi-Square Test: Test of Independence			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	22.527[a]	6	<.001
Likelihood Ratio	22.962	6	<.001
Linear-by-Linear Association	2.862	1	.091
N of Valid Cases	837		

Chi-Square Test: Goodness-of-fit	
	Attitudinal
Chi-Square	4.515[a]
df	3
Asymp. Sig.	.211

i. Based on the test of independence output, is there evidence of a significant association between the amount spent per month on marketing activities and attitudinal segment? Use 5 percent significance level. [7 marks]

ii. Based on the goodness-of-fit test output, is there evidence of a difference in the proportion of small businesses among the four attitudinal segments? Use 5 percent significance level. [7 marks]

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b) The following data represent the coffee exports (in thousands of 60kg bags) by Costa Rica from year of 2006 to 2013.

Year	2006	2007	2008	2009	2010	2011	2012	2013
Export Units	1310	1364	1440	1236	1200	1243	1374	1344

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	2724.127	144.9801	18.78966	0.033849
X Variable 1	-0.14866	0.068815	-2.16023	0.276
X Variable 2	-0.39719	0.063708	-6.23445	0.101251
X Variable 3	-0.56236	0.07624	-7.37611	0.085785

Third-order Autoregressive Model

i. Smooth the series exponentially using a smoothing coefficient of W=0.25. [7 marks]

ii. From the given output, derive the third-order autoregressive model and test the appropriateness of the fitted model at the 10% significance level. [5 marks]

iii. Predict the units of coffee exports for 2014 and 2015. [4 marks]

Note: Use two decimal places (at most) for all values.

End of Question.